PART I - ADMINISTRATIVE

Section 1. General administrative information

Title of project

Restore Unobstructed Fish Passage To Duncan Creek

BPA project number: 20013
Contract renewal date (mm/yyyy): ☐ **Multiple actions?**

Business name of agency, institution or organization requesting funding
Skamania Landing Owners Association (SLOA)

Business acronym (if appropriate) SLOA

Proposal contact person or principal investigator:

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NPPC Program Measure Number(s) which this project addresses
7.5D(.1); 7.5E(.1); and 7.11B(.1)

FWS/NMFS Biological Opinion Number(s) which this project addresses

Other planning document references
Washington Deparment of Fish and Wildlife, District 9 Work Plan (Fish Restoration Priority. Vancouver Regional Office. 1998)

Short description
Restore unobstructed fish passage to Duncan Creek from the Columbia River through creation of an open concrete fish flume at the mouth of a dam co-managed by the Skamania Landing Owners Association and Washington Department of Fish and Wildlife.

Target species
Chum, Coho, Steelhead and Sea-run Cutthroat

Section 2. Sorting and evaluation

Subbasin
Lower Columbia Mainstream (Washougal)

Evaluation Process Sort

CBFWA caucus	Special evaluation process	ISRP project type

Mark one or more caucus	If your project fits either of these processes, mark one or both	Mark one or more categories
☒ Anadromous fish ☐ Resident fish ☐ Wildlife	☐ Multi-year (milestone-based evaluation) ☐ Watershed project evaluation	☐ Watershed councils/model watersheds ☐ Information dissemination ☐ Operation & maintenance ☒ New construction ☐ Research & monitoring ☐ Implementation & management ☐ Wildlife habitat acquisitions

Section 3. Relationships to other Bonneville projects

Umbrella / sub-proposal relationships. List umbrella project first.

Project #	Project title/description
	NA

Other dependent or critically-related projects

Project #	Project title/description	Nature of relationship
	NA	

Section 4. Objectives, tasks and schedules

Past accomplishments

Year	Accomplishment	Met biological objectives?
	NA	

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Restore unobstructed fish passage to Duncan Creek, an historical spawning ground for naturally reproducing populations of chum, coho and sea-run cutthroat.	a	Repair Duncan Creek Dam and replace existing culvert with open concrete fishway.

Objective schedules and costs

Obj #	Start date mm/yyyy	End date mm/yyyy	Measureable biological objective(s)	Milestone	FY2000 Cost %
1	7/1999	1/2000	NPPC Program Measure #'s 7.5D(.1); 7.5E (.1); and 7.11B(.1)		100.00%
				Total	100.00%

Schedule constraints

Completion date
2000

Section 5. Budget

FY99 project budget (BPA obligated):

FY2000 budget by line item

Item	Note	% of total	FY2000
Personnel	In-Kind and Covered by SLOA	%0	
Fringe benefits	NA	%0	
Supplies, materials, non-expendable property	Materials and construction costs for fishway, mitigation and portions of dam repairs.	%100	190,000
Operations & maintenance	To be performed by SLOA/WDFW	%0	
Capital acquisitions or improvements (e.g. land, buildings, major equip.)	Land Owned by SLOA	%0	
NEPA costs	Completed	%0	
Construction-related support	Covered by SLOA	%0	
PIT tags	# of tags: NA	%0	
Travel	NA	%0	
Indirect costs	Covered by SLOA	%0	
Subcontractor	Included in constuction costs	%0	
Other	NA	%0	
		TOTAL BPA FY2000 BUDGET REQUEST	$190,000

Cost sharing

Organization	Item or service provided	% total project cost (incl. BPA)	Amount ($)
SLOA	Dam repair; grant and project adminstration/preparation; Construction contingencies and services; permits; and preliminary	%33	195,840

	engineering costs.		
WDFW	Fishway design; technical assistance; project oversight.	%2	10,000
BPA	Fish flume final design costs, materials and constuction.	%32	190,000
		%0	
		Total project cost (including BPA portion)	$585,840

Outyear costs

	FY2001	FY02	FY03	FY04
Total budget	$0			

Section 6. References

Watershed?	Reference
☐	Manlo, Steve. 1998. District 9 Work Plan: Fish Passage Restoration Priorities. Washington Department of Fish and Wildlife, Southwest Regional Office. Vancouver, WA.
☐	Columbia River Gorge National Scenic Area Ordinance and Management Plan.
☐	Skamania County Critical Areas Ordinance
☐	

PART II - NARRATIVE

Section 7. Abstract

This proposal will restore anadromous salmonid passage through a dam owned and operated by the Skamania Landing Owners Association (SLOA), located at the mouth of Duncan Creek in Skamania County. In its current condition, this dam is a complete passage barrier to chum salmon and a partial barrier to coho salmon and steelhead. All of these species are currently listed or are candidates for listing under the federal Endangered Species Act. Restoration of passage will be accomplished by replacing an existing six-foot diameter culvert with an open concrete flume fishway. Design of the flume was completed by a Washington Department of Fish and Wildlife (WDFW) engineer, and represents the favored alternative for future fish passage. This project will restore access to historical chum salmon spawning in springs and seeps along the perimeter of Duncan Lake (400 linear meters) and an additional 4000 linear stream meters of coho and steelhead spawning and rearing habitat along Duncan Creek. Improved fish passage and rebuilding of naturally reproducing populations of chum, coho and sea-run cutthroat are priorities described in the 1994 Fish and Wildlife Program as amended in 1995. Duncan Creek is one of only a handful of streams on the Columbia which have historically supported chum production. Work is expected to begin in summer, 1999 and be completed by winter, 2000. Project success will be monitored by WDFW and SLOA residents, through annual fish counts and habitat inspection. Additional habitat restoration will be provided as needed in following years.

Section 8. Project description

a. Technical and/or scientific background

As noted in the 1994 Fish and Wildlife Program, chum salmon counts in the Columbia River Basin have dropped dramatically since the 1950's and, for the most part, are now found only in the Grays River and Hardy and Hamilton Creeks. Historically, Duncan Creek in Skamania County also supported chum

production. With the restoration of unobstructed fish passage to this area from the Columbia River, the Skamania Landing Owners Association (SLOA) whose members live in the immediate vicinity and Washington Department of Fish and Wildlife (WDFW) believe that naturally reproducing populations of chum will once again colonize spawning springs, seeps and habitat existing within Duncan Lake and Creek.

WDFW recorded a count of 506 chum salmon in Duncan Creek in 1951. This number dropped precipitously after construction of Duncan Creek Dam in 1963, and only one carcass was counted upstream by 1996. Although the dam incorporated prescribed fish passage facilities in its construction, the resulting 6-foot diameter culvert was eventually determined to be a complete barrier to chum salmon passage, and slightly less so for coho and sea-run cutthroat.

WDFW and SLOA have maintained a cooperative relationship in the operation and management of the dam since its construction, and share responsibility for habitat maintenance and fish monitoring. In this vein, the two entities, in conjunction with the US Department of Fish and Wildlife (USFWS) began to work on the Duncan Creek Dam Fish Passage Restoration Plan starting in the mid 1980's to repair the dam and create unobstructed access to spawning grounds.

After developing and evaluating various options, it was determined that an open, concrete fish flume would provide the most effective passage. Removal of the dam would eliminate Duncan (or Shahala) Lake, and completely destroy the centerpiece of Skamania Landing – and therefore does not have the support of SLOA members. To simply repair the dam and not build a flume would be to ignore the imperative – and is not acceptable to either SLOA members or WDFW. As a result, WDFW engineers were asked to recommend and design an appropriate flume which was later reviewed and approved by the USDFW and SLOA. SLOA has since contracted a professional engineering firm to provide preliminary engineering services and committed to financially and physically seeing the project through to a successful completion. Engineering and design of the dam repairs and flume construction are described further in the "Methods" section below.

It should also be pointed out that this project also addresses coho salmon and sea-run cutthroat concerns identified in the 1994 Fish and Wildlife Program. Duncan Creek is host to habitat and spawning grounds for both species, and while the existing dam culvert does not entirely prevent their passage, it is a significant hindrance. Replacement of the existing culvert with a well designed open flume will improve passage for these fish into upper Duncan Creek.

b. Rationale and significance to Regional Programs

As described above, this project will directly address 1994 Fish and Wildlife Program objectives: 7.5D(.1); 7.5E(.1); and 7.11B(.1). These three objectives call for the states of Oregon and Washington to identify naturally reproducing populations of chum salmon and sea-run cutthroat and to adopt management goals to rebuild those populations to self-sustaining levels. In terms of fish passage, the Fish and Wildlife Program describes a need to "…implement nedded fish passage improvements at …diversion dams, canals and ditxhes in the basin. Lower river passage improvements will be made first …" These are the stated goals of the proposed project.

We will work toward achieving these goals by: A) Restoring unobstructed fish passage from the Columbia River to Duncan Creek by replacing the existing culvert at Duncan Creek Dam with an open, concrete fishway; B) Facilitating the return of chum, as well as coho and sea-run cutthroat, to historical spawning springs around the perimiter and shoreline of Duncan (Shahala) Lake and Creek.

While increasing populations of naturally reproducing chum and cutthroat species is a priamary goal of the overall Fish and Wildlife Program, it is of the utmost imporance within the lower Columbia subbasin where Duncan Creek is one of only four tributaries known to support natural chum production (Other producing streams include nearby Hardy and Hamilton Creeks as well as Gorley Springs). If successfully completed, the project will complement previous and current efforts in the other three tributaries as described in the following section. Alternatively, should the project fail to be realized, it will most certainly constitute a major setback for regional chum production efforts.

c. Relationships to other projects

In addition to addressing the goals of the 1994 Fish and Wildlife Program, this project will complement efforts undertaken by the WDFW, the United States Fish and Wildlife Service and the Lower Columbia Fish Enhancement Group.

Projects which have targeted chum salmon within the immediate area include, but are not limited to, riparian and instream habitat restoration, completed in Hardy Creek by the USFWS and Lower Columbia Fish Enhancement Group in 1995-1996; instream habitat enhancement in Good Bear and Woodard Creeks, completed by the United States Forest Service National Scenic Area Office in 1995-1996; and 900 lineal feet of chum salmon spawning habitat restoration in Hamilton Creek completed by WDFW in 1996. Duncan Creek is also part of a watershed assessment currently being conducted by the USFS.

These efforts, along with the proposed project, comprise a regional effort to recover salmonid populations identified by local, state and federal resource agencies as outlined in the Fish and Wildlife Program. As the potential for chum recovery is so limited along the lower Columbia mainstream, it is imperative that passage and habitat improvements be carried out, managed and monitored in each of the known tributaries.

d. Project history (for ongoing projects)

Not applicable – new project.

e. Proposal objectives

1) Restore unobstructed passage to Duncan Creek, an historical spawning ground for chum, coho and sea-run cutthroat.

f. Methods

Unobstructed fish passage to Duncan Creek will be achieved by repairing an earthen dam at the mouth of the creek and replacing an existing culvert with an open, concrete fish flume. The flume was proposed and originally designed by WDFW Ken Bates following a request by other WDFW personnel. The fishway represents the best possible solution to current fish passage problems at Duncan Creek, because it allows for the recovery of chum salmon, facilitates coho and sea-run cutthroat passage and preserves the integrity of the Landing and Shahala Lake – the location of several dozen Skamania County households.

Preliminary engineering for the fishway has been completed, and final design documents are to be delivered in early 1999. The fishway will be offset 10 feet from the existing dam spillway to facilitate excavation and backfill compaction needed for the fishway and new discharge culvert. This location will utilize the excavation made for removing the existing discharge culvert. The fishway will be a weir and pool type (pending final WDFW approval), 6-feet wide and equipped with 5-feet high concrete weirs, designed to step the water down in 0.75-foot increments. Weir size was based on the pool volume needed to dissipate flow energy and maintain plunge flow. The optimum pool length, width and depth was selected based on the estimated concrete volume needed for construction. Each weir has an orifice located at the bottom. The orifice provides passage for chum salmon and aides flow hydraulics. SLOA's contractor, David Newton and Associates, designed the structure following WDFA Fishway Design Guidelines for Pacific Salmon (Bates, Ken. WDFW, 1992).

The orifices and overall slope and vee-shaped configuration of the fishway will allow deposited sediment to be flushed out the structure. A vertical gate installed at the inlet will provide flow control, and allow adjustment in reservoir water surface elevations. The gate will be closed following migration season, which will allow the pool to rise to the 15.5-foot spillway elevation. Elevation of the fishway outlet will be approximately 2-feet and the elevation of the inlet, 10-feet. The top of the existing discharge culvert is approximately 6-feet. As improvements to the dam reduce leakage, the reservoir level will be raised to an

optimum level (to be determined by David Newton and Associates in conjunction with WDFW in early January) in order to greatly enhanced fish passage. The concrete flume would be open from the start of the migration period (October), and would be closed after the juvenile outmigration period (late spring, early summer).

Other improvements have been designed for the discharge culvert and spillway as well as scour and seepage control. The majority of work will take place during summer months to avoid disturbing fish rearing activity. Erosion control measures, including revegetation, will be carried out to minimize impacts to the riparian zone or stream corridor during implementation of the project.

Success will be measured through continued monitoring of chum, coho and sea-run cutthroat by both WDFW and SLOA. Final engineering and construction of the fishway facility will be contracted to qualified firms and adhere to all local, state and federal guidelines. Though the majority of pertinent permits have been applied for and granted, several will need to be resubmitted due to stalls created by a funding shortfall. The dam and fishway will be co-managed by SLOA and WDFW. SLOA will be responsible for the care of new seedlings and plants used in mitigation. WDFW and USFS have offered to provide technical assistance with these efforts as well as future habitat enhancement endeavors.

This project has received favorable reviews from the Underwood Conservation District, WDFW, USFW and others working toward the goal of species restoration in our area. It is considered to have a high likelihood of success for the following reasons: A) SLOA has a strong record of maintaining and operating the existing culvert on a seasonal basis to facilitate fish passage as arranged through an agreement with WDFW. There is every reason to believe this will continue. B) The project is of utmost importance to resource agencies working in the area – and has been rated as a top fish restoration priority by the WDFW Vancouver regional office for WDFW District 9. C) SLOA has committed both personally and professionally to completing the project. It will be providing approximately half of total project cost through a special self-tax assessment, and membership consists of legal, engineering and biology professionals with experience in administering projects of this nature. D) The project has an outstanding cost-share ratio. One local dollar will be spent for every federal dollar. E) Future resource protection is unparalleled. Approximately 160 acres of the upper Duncan Creek watershed in owned by WDFW and protected for perpetuity. In addition, SLOA has been careful to site all development away from sensitive stream and wetland areas, and no new development is likely to ever affect those areas as both the Skamania County Critical Areas and Columbia River Gorge National Scenic Area Ordinances mandate protective buffers of 50-300 feet on either side of the stream within the entire watershed.

g. Facilities and equipment

This project will utilize traditional building materials for dam repair and fishway construction. Fending, grating and seedlings will also be purchased. No other equipment will be needed or requested for this project. Outyear maintenance costs will be the responsibility of SLOA.

h. Budget

Cost estimates for this project have been developed by a professional engineering firm with input from WDFW. The cost break-down is as follows:

SLOA:	195,840
BPA:	190,000
WDFW:	10,000
Total:	395,840

SLOA has authorizes a special self-tax of $200,000 which will cover design and engineering, permitting, construction services and portions of the dam repair as well as all contingencie should construction cost estimates be exceeded. WDFW is contributing approximately $10,000 in-kind for technical assistance, project oversight and preliminary fishway design and engineering. The net request from BPA will cover construction of the fishway and associated dam repair needs, including erosion control and safety features.

It is hope that SLOA's contribution (49% of total project cost) will be seen as indicative of the Association's commitment to the project. SLOA has done everything in its power to complete this project, but does not have the financial resources to cover all necessary improvements. SLOA has earmarked this funding specifically for the proposed project, and it will remain available for that sole purpose until completed.

Section 9. Key personnel

Because this project is relatively straight-forward, key personnel is limited to the following individuals:

Steve Manlo, WDFW Southwest Region, Area Habitat Biologist
Wolf Dammers, WDFW Southwest Region, Fish and Wildlife Biologist
Ken Bates, WDFW Southwest Region, Fishway Engineer
Andrew Jansky, SLOA Member, Licenced Engineer
Larry Kapinos, SLOA Member, Licensed Engineer
David Newton (and Associates), Professional Engineering Firm

Each of these individuals has helped in the development of this project, and will be instrumental in both implementation and monitoring activities. While all design, engineering and habitat assessment was overseen or completed by the individuals described above, it is likely that construction of the fishway and dam repairs will be contracted out through bid. Construction services will be provided by a contractor with considerable experience in projects of this nature.

Section 10. Information/technology transfer

This project will be closely monitored by WDFW and other resource groups working in either this same geographical area or with similar species restoration projects. The outcome of this project will be recorded by WDFW and incorporated into other recovery plans in areas facing similar circumstances if successful. Spawning surveys will be conducted annually and compared with results from other fish producing streams in order to determine "what's working." Should this particular fishway prove extremely effective for fish passage, it will likely be promoted elsewhere by WDFW.

Congratulations!